

### REMARKS

The Examiner is thanked for the Official Action of January 27<sup>th</sup>, 2004. This request for reconsideration is intended to be fully responsive thereto.

#### Specification

The substitute specification submitted on December 5, 2003 was not entered because Applicant failed to state that no new matter had been entered. The marked up specification and the clean copy of the specification are submitted herewith and it is stated that no new matter has been added. Therefore, the Examiner's objection has been overcome and the substitute specification should be entered.

### REJECTION UNDER 35 U.S.C. § 112

#### Examiner's Rejection

Claim 10 is rejected for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner states that the claim provides for the use of an electrode but the claim does not set forth any steps involved in the method/process and therefore it is unclear what method/process the applicant is intending to encompass. Examiner states that the claim is indefinite because it merely recites a use without any active, positive steps. The claim has been amended to read "The method for manufacturing an electrode structure according to claim 1, wherein the electrode structure is used for the formation of a battery" thereby reciting a step and thus making the examiner's rejection moot. No new matter has been added.

### REJECTION UNDER 35 U.S.C. 103(a)

#### Examiner's Rejection

Claims 1, 3, 4, 9 and 10 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent No. 5,462,820 (Tanaka), of record. The Examiner states that the difference between claim 1 and Tanaka is the scope of the ranges of the speed of the air and temperature of the air. Applicant respectfully disagrees with the Examiner and also contends that the prior art is overly broad.

#### Overly Broad Claims, Air Speed

First, Applicant contends that Tanaka's ranges are **overly broad** and that the

difference in the range or value is not minor. With respect first to the speed of the air, Tanaka teaches air ranges from 0.1 to 100 m/sec and preferably 1 to 30 m/sec. The present invention, however, teaches using an air speed of 0.1 to 3.0 m/sec.

The Examiner states that a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. V. Banner, 778 F.2d 775, 783 and 227. Applicant respectfully disagrees with the Examiner in that the difference in the range or value is not minor. Applicant contends that Tanaka's range of 0.1 to 100 m/sec is overly broad and that it would not be obvious to someone in the art to utilize the air speed taught in the present invention.

Tanaka teaches a preferred range of 1 to 30 m/sec. This is still an overly broad range when compared to the extremely narrow range taught by the current invention, i.e., 0.1 to 1 m/sec. and Applicant contends that it would not be obvious to one in the art to use such a slow air speed.

Claimed range achieves unexpected results relative to the prior art range.

Air Speed

Applicant further argues that, even though the claimed ranges "overlap or lie inside ranges disclosed by Tanaka," there is sufficient evidence indicating that the claimed ranges are critical. MPEP 2144-134, III Rebuttal of Prima Facie Case of Obviousness, *Woodruff* states that the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.

The conventional method of FIG. 4 (A) shows the use of fast moving air (15 to 25 m/sec.). Tanaka teaches the preferred range of 1 to 30 m/sec. and therefore FIG. 4(A) is within Tanaka.

In Tanaka or FIG. 4(A), because fast moving air is used the compound mixture surface is **quickly** warmed and the solvent around the surface is also **quickly** vaporized. As a result of the fast moving air speed several problems occur. First, the solvent at the internal portion of the compound mixture and the solvent near the current collector 13 migrate quickly to the vicinity of the surface area in order to try to compensate for the solvent that has vaporized from the surface area. Simultaneously the binder and the powdered conductive material contained in the solvent **quickly** migrate to the vicinity of the surface area. As a result, the density/concentration of the binder and the powdered conductive material at the current collector side is lower. The result of these two actions is a fragile electrode layer that is easily broken or peeled. Also, the resultant resistivity in the vicinity of

the current collector 13 becomes high and the overall resistance of the electrode layer increases.

In the present invention, the claimed range displays several unexpected results and superiority of properties shared with Tanaka's range. First, the resultant electrode layer of the present invention adheres better to the current collector and is more durable than Tanaka. Also, the resistivity in the vicinity of the current collector 13 is lower and the overall resistance of the electrode layer is decreased. These unexpected superior results are achieved because the warm breeze 51 **gradually** warms the compound mixture 31 in its entirety and **gradually** vaporizes the solvent from the surface of the compound mixture 31. The current method prevents the quick migration of the compound mixture, binder and the powdered conductive material 14 and therefore the density/concentration remains uniform overall.

The resultant properties differ to such an extent that the differences are really unexpected. MPEP 716.02 Allegations of Unexpected Results, *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Even though the current invention has properties that are shared with the prior art the current method shows evidence of unobvious or unexpected advantageous properties, specifically, the present invention is much stronger and more durable than Tanaka and the admitted prior art and has higher resistivity than that of the prior art. MPEP 716.02(a).

#### Overly Broad Claims, Temperature

The Examiner states that Tanaka teaches a temperature range from 20° to 350° C and preferably 40° to 200° C. As argued above the Applicant contends that Tanaka's ranges are **overly broad** and that the difference in the range or value is not minor. Tanaka's range of 20° to 350° C is overly broad and that it would not be obvious to someone in the art to utilize the narrow air temperature range taught in the present invention. Tanaka teaches a preferred range of 40° to 200° C. This is still an overly broad range when compared to the extremely narrow range taught by the current invention, a warm breeze 51 of the present invention is preferably in the range of 60 to 150°C, and Applicant contends that it would not be obvious to one in the art to use such a narrow temperature range.

#### Claimed range achieves unexpected results relative to the prior art range, temperature

Even though the claimed ranges "overlap or lie inside ranges disclosed by the prior art," there is sufficient evidence indicating that the claimed ranges are critical. *Woodruff* states that the applicant must show that the particular range is critical,

generally by showing that the claimed range achieves unexpected results relative to the prior art range.

As argued above, the temperature range of the present invention is much more narrow than that taught in the prior art. The admitted prior art (APA) uses hot air at 80 to 200 centigrade. Tanaka uses 20 to 350, preferably 40 to 200. On the other hand, the present invention blows a warm breeze between 60 to 150°C onto the coated compound mixture to gradually vaporize the solvent. The present invention results clearly show sufficient justification to overcome this rejection. That is, the resultant electrode of the present invention is much stronger and has lower resistivity than that of existing art. As argued above, the resultant properties differ to such an extent that the differences are really unexpected. *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Even though the current invention has properties that are shared with the prior art the current method shows evidence of unobvious or unexpected advantageous properties, specifically, the present invention is much stronger and more durable and the current invention has higher resistivity. MPEP 716.02(a).

#### Conclusion

The Examiner states that it would be obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Tanaka by selecting any temperature and air speed in the range of Tanaka since it would have provided sufficient means for evaporating the solvent from the electrode. Applicant agrees that any combination of air and temperature would be sufficient to evaporate the solvent from the electrode. However, the reason the current speed and temperatures were chosen was not to simply evaporate the solvent but rather, to achieve a more desirable end result. In other words, the desired end result of the present invention is to create a resultant electrode layer that adheres better to the current-collecting member and one that is more durable than that of Tanaka. Also, the resistivity in the vicinity of the current collector 13 is lower and the overall resistance of the electrode layer is decreased. These unexpected results were not obvious to one of ordinary skill in the art at the time the claimed invention was made and these resultant properties differ to such an extent that the differences are really unexpected.

The Examiner further states that a prima facie rejection is properly established when the difference in the range or value is minor. Applicant contends that the difference in the range or value of the present invention is not minor. As argued above the prior art range or value is overly broad, the differences for both air

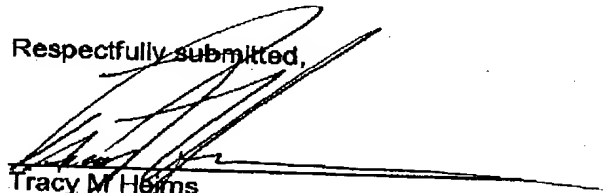
speed and temperature are significant and therefore no valid prima facie rejection exists.

Finally, the Examiner states that when the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists and that the differences in ranges will not support the patentability of the subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. Applicant contends that there is sufficient evidence indicating that the claimed ranges are critical and that, as argued above, the claimed range achieves unexpected results relative to the prior art range.

Accordingly, it is respectfully submitted that claims 1, 3, 4, 9 and 10 define the invention over the cited references and notice to this effect is respectfully solicited. Applicant believes that the claims are now in condition for allowance. No new matter has been added.

Should Examiner believe further discussion regarding the above claimed language would expedite prosecution they are invited to contact the undersigned at the number listed below.

Respectfully submitted,



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